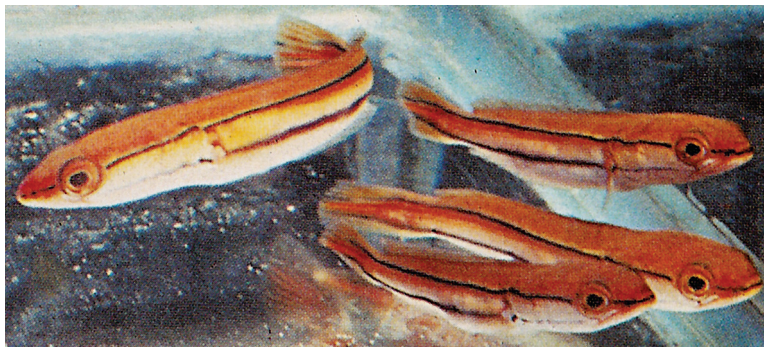
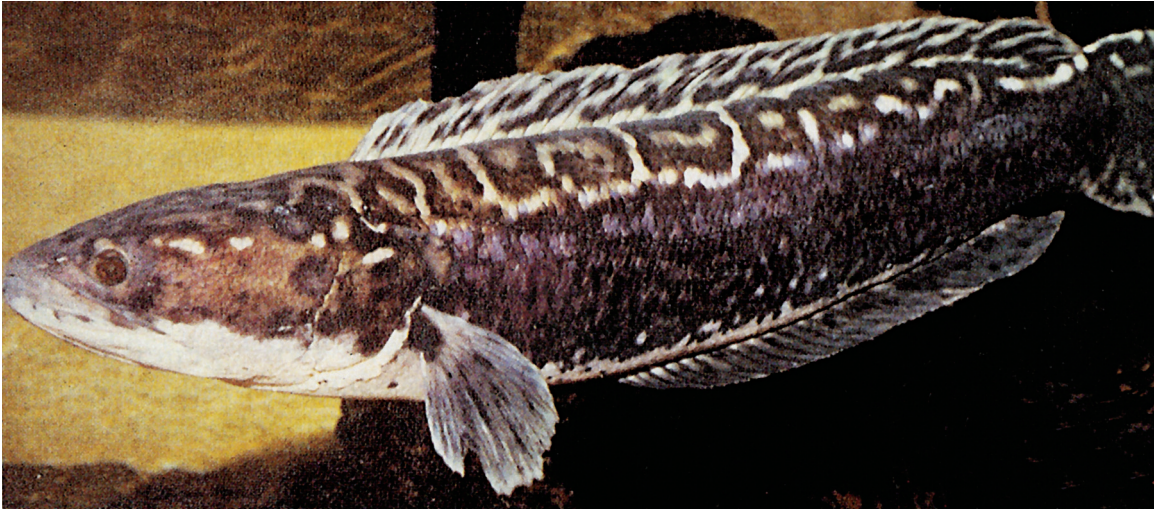
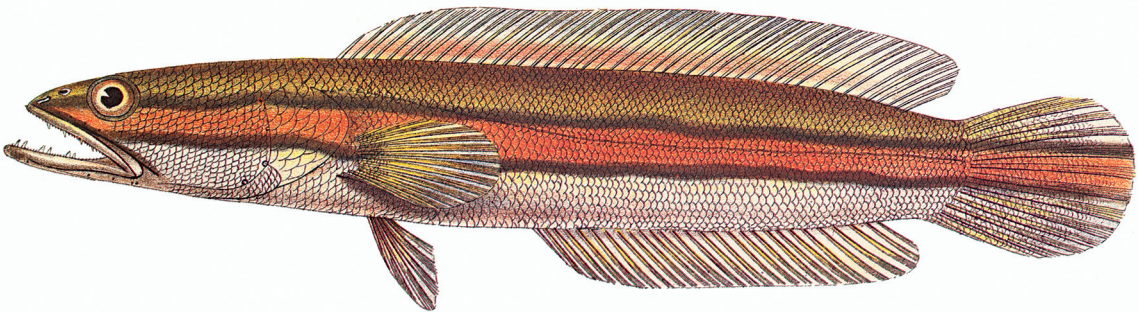


***Channa micropeltes* (Cuvier, 1831)**
Giant Snakehead



Upper image: young adult; photo by P.R. Sweet. **Lower image:** young juveniles. Reprinted with permission from P.K.L. Ng from: Lee, P.G., and P.K.L. Ng. 1991. The snakehead fishes of the Indo-Malayan region. Nature Malaysiana 16(4):112-129



After Bleeker, 1878; juvenile

Original description: *Ophicephalus micropeltes* Cuvier in Cuvier and Valenciennes, 1831:427. Histoire naturelle des poissons 7:i-xxix +1-537, pls. 170-208. Type locality: Java, Indonesia. Syntypes: RMNH D2318; possible syntypes: RMNH D1131, RMNH D1132.

Synonyms: *Ophiocephalus serpentinus* Cuvier, 1831:429.

Ophicephalus bivittatus Bleeker, 1845:519.

Ophiocephalus stevensii Bleeker, 1853:444.

Ophiocephalus diplogramma Day, 1865a:36.

Ophiocephalus diplogramme [sic] Day, 1865b:147.

Ophiocephalus studeri Volz, 1903:555.

Common names: **giant snakehead**; red snakehead, redline snakehead; Malabar snakehead; Mala; ikan toman, toman (Malaysia); pla chado (Thailand), pla melang pu (Bangkok, Thailand); trey diep (juvenile) and trey chhdaur (adult; Cambodia); toman, anak toman, gabus tobang (Kalimantan). The name red or redline snakehead is commonly applied to juveniles of this species in the aquarium fish trade.

Native range: This snakehead has a markedly disjunctive distribution. Rivers of the Malabar (southwestern) Coast of India (restricted to Kerala State, southwestern India *vide* Roberts, 1989; Talwar and Jhingran, 1992); Myanmar (?); Thailand; Mekong basin of Laos; Vietnam; Malaysia; southeastern Sumatra; Kalimantan, particularly the Kapuas basin (southwestern Borneo; Roberts, 1989; Rainboth, 1996); Bangka and Belitung (Billiton) islands; northern Java (Day, 1877; Mohsin and Ambak, 1983; Roberts, 1989; Lee and Ng, 1991, 1994; Kottelat, 1985, 2001a). Its presence in Myanmar (Burma) is questionable. Ismail (1989) stated that it is “quite common in peninsular Malaysia.”

We found it most puzzling that a species described from southeastern Asia (Java) could have a disjunctive distribution between a reported range in southwestern India (Kerala State) and Thailand, its westernmost confirmed range in southeastern Asia, a distance of about 2,500 km. Such a distribution gap indicates that the form in Kerala State, India, is either a different species or perhaps a very early introduction from its native range. We believe the latter interpretation is correct.

Day (1865a) described *Ophiocephalus diplogramma* based on one specimen, about 42 mm in length, collected in October 1863 near the port city of Cochin in southwestern India. Day (1865b) provided a species account for *O. diplogramme* [sic], his entry based on the same juvenile specimen collected in 1863 near the “mouth of the Cochin River.” The characters he provided in that original description closely match those of *Channa micropeltes*, and his description of the life coloration appears to be that of a juvenile giant snakehead.

We believe that the description of *Ophiocephalus* (= *Channa*) *diplogramma* was based on a juvenile *C. micropeltes* and that its presence in Cochin, Kerala State, India, was the result of one or more introductions from southeastern Asia that occurred prior to the mid-1800s. Cochin has been a major trading port for several centuries. Moving an airbreathing snakehead, even on sailing ships from its native range to a new locale some 2,500 km or greater distance away, would have been an easy task. The progeny from this introduction, resulting from a small founder population, would be expected to exhibit some small degree of character divergence when compared to the source population within its native range.

Introduced range: This species was reported from Maine, Massachusetts, and Rhode Island, without evidence of reproduction (Courtenay and others, 1984; Fuller and others, 1999). A review of photographs of snakeheads captured from open waters of Maryland, undertaken by Maryland Department of Natural Resources personnel during Summer 2002, revealed two specimens of giant snakeheads that had been caught on separate occasions in different drainages during the two previous years. On September 6, 2002, a specimen about 56 cm long, was found struggling near the surface in shallow water of the Inner Harbor, Baltimore, Maryland, and captured by dipnet. All captures of this species appear to be of released pet fish. Two specimens, about 46 cm in length, were confiscated from an aquarium fish dealer in Los Angeles, California, in 2000 (Camm Swift, personal commun., 2002). California is one of fourteen states where snakeheads were prohibited before summer 2002.

Size: To 1 m and weight of over 20 kg (Roberts, 1989; Lee and Ng, 1991; Talwar and Jhingran, 1992). Peter Ng (personal commun., 2003) noted that this snakehead is known to reach a length of 1.5 m. Wee (1982) cited this species and *Channa marulius* as the two fastest growing snakeheads.

Habitat preference: Lakes, rivers, canals, and reservoirs (Mohsin and Ambak, 1983; Lee and Ng, 1991). Kottelat (1998) stated a preference for “deep water bodies.” This species is nearly incapable of over-land movements (Ng and Lim, 1990) except for the young (Peter Ng, personal commun., 2002), but he has observed large individuals attempting to move on dry land. Rainboth (1996) noted a preference for “standing or slowly flowing waters.”

Temperature range: No specific information, but its native range is between 20° N to about 7° S, indicating a subtropical/tropical species.

Reproductive habits: Like other channids, *Channa micropeltes* clear a circular area of vegetation, spawn, and the pelagic eggs rise to the surface where they are fiercely guarded by the parents. Guarding continues after hatching (Lee and Ng, 1991), probably until young become demersal.

Feeding habits: Primarily a daytime feeder (Ng and Lim, 1990). Accounts of this species almost invariably describe it as a vicious predator on other fishes. Adult and perhaps subadult *Channa micropeltes* feed in packs, usually in midwaters or near the surface. Parents guard their eggs and young, and are reported to have attacked humans that approached a nest (Smith, 1945; Lee and Ng, 1991). Kottelat and others (1993) stated that anglers and swimmers who got too close to young were attacked, some seriously wounded, and that there have been fatalities. The report of fatalities was from local fisheries officials (Maurice Kottelat, personal commun., 2003). Peter Ng (personal commun., 2002) commented that he knew of one instance where a man was nearly castrated by an attacking giant snakehead. Prey includes other fishes, frogs, and birds (Lee and Ng, 1994). Lee and Ng (1991) commented that authorities at the Singapore Botanic Gardens planned to remove *C. micropeltes* from ponds at that facility because this snakehead was feeding on cygnets. Ng and Lim (1990) referred to this species as the “most ravenous” of snakeheads, and they, Mohsin and Ambak (1983), and Roberts (1989) noted that it is known to kill more fishes than it

consumes in its natural habitat. Ng and Lim (1990) described the enlarged canine teeth of *C. micropeltes* as being knifelike, “with two cutting edges in cross-section,” the edges arranged perpendicular to the body axis. This allows shearing of prey.

Beeckman and De Bont (1985) reported that the digestive system of the giant snakehead is relatively short, that young fed on crustaceans and adults are piscivorous in the Nam Ngum reservoir, Mekong basin, in northern Laos. They noted parasites in stomachs of 60 percent of all specimens captured with even more found in the intestines. Parasitism apparently begins when this species becomes piscivorous.

Cowx (1998) commented that escapes of Chinese carps, tilapias, and oscar (*Astronotus ocellatus*) from cage culture in Chenderoh Reservoir, Perak, Malaysia, failed to establish breeding populations. He attributed this failure to predation by giant snakeheads.

Characters: A patch of scales present in the gular area. Head depressed, somewhat pointed, and flattened above. Mouth large, oblique, maxillary reaching beyond posterior border of the eye. Lower jaw with several canine-like teeth behind a single row of villiform teeth, the latter expanding to about 5 rows at the jaw symphysis; large canine teeth on prevomer and palatines. Scales on top of head small; 16-17 scale rows between preopercular angle and posterior border of orbit; predorsal scales 22; 95-110 scales in longitudinal series, although Ismail (1989) reported 82-91 for specimens from peninsular Malaysia. This species obviously has smaller scales than other large *Channa*, hence the species name *micropeltes* (=small scale). Dorsal fin rays 43-46; anal fin rays 27-30; pectoral rays 15; pelvic rays 6; caudal fin rounded. Pelvic fin about 50 percent of pectoral fin length (Talwar and Jhingran, 1992; Musikasinthorn and Taki, 2001).

Commercial importance in the United States: This species frequently appears on aquarist-oriented websites. Although several sites warn that *Channa micropeltes* is only suitable for aquarium purposes as juveniles, require substantial amounts of animal food, and should not be kept with other fishes, it has been available in aquarium fish retail stores in states where snakeheads are not prohibited. One retailer who sells snakeheads via the Internet reported that he refused to sell this species to individual hobbyists (Ken Arnold, personal commun., 2002). Releases of this species into waters of Maine, Maryland, Massachusetts, and Rhode

Island were likely made to dispose of fish that grew too large for aquaria. We also know of two instances, one in 2001 and another in 2002, when juvenile giant snakeheads were confiscated from pet shops in southern California. Because it is an esteemed food fish in southeastern Asia, it has possibly been available periodically in live-food fish markets.

Commercial importance in native range:

Talwar and Jhingran (1992) remarked that this species is only of minor interest to fisheries in Kerala State, India. Conversely, Lee and Ng (1991) stated that it is a highly prized food fish in Malaysia, and grown in cage culture where it is fed tilapia. It is also grown in cage culture in the lower Mekong basin of southern Vietnam where it and *Channa striata* collectively comprise the

second most important fish group under culture (Pantulu, 1976; Wee, 1982). FAO (1994) listed a production of 1,490 metric tons of this species in Thailand in 1992, up from 386 tons in 1986. Rainboth (1996) noted that it is sold fresh and sometimes as live fish in Cambodian markets, and that it is cultured in cages.

In the Kapuas River of western Kalimantan, there is a hook fishery for *Channa micropeltes*, particularly within the Danau Sentarum Wildlife Reserve. About 40 percent of the fishes caught with large (sizes 5-8) hooks and 60 percent taken with medium (sizes 9-11) hooks were giant snakehead. In recent years, cage culture has developed for this species in the Reserve where large numbers of



Mark Sabaj (left) purchasing specimens of giant snakehead for the Academy of Natural Sciences, Philadelphia, caught from Khao Laem Reservoir, an impoundment of Mae Nam Khwae Noi River, in a market in Thong Pha Phum, Thailand, in 2001. Photo by Mike Hardman, Los Angeles County Museum of Natural History.

juveniles are caught with cast nets, raised in wooden cages, and fed other wild caught fish until they reach market weight of 0.8-1.5 kg. This earns about \$700,000 for the communities and represents one-third of fish-related income in the Reserve. Recently recognized problems with this activity include fear of diminished populations of giant snakehead due to removal of young from the wild for culture purposes and the estimated 4,000 tons of river-caught fish needed annually to feed them (Dudley, 2000).

Environmental concerns: *Channa micropeltes* has a reputation of being the most predacious of all snakeheads, known to kill more fishes than it consumes. Its greatest threat in the U.S. would be in southern Florida and Hawaii where this subtropical/tropical species would likely establish if introduced.

Comments: The diploid number of chromosomes of *Channa micropeltes* is 44 (Donsakul and Magtoon, 1991).

See map on following page



Channa micropeltes, caught by angler John Oatley; Khao Laem Reservoir, Kanchanaburi Province, Thailand, 2002. Photo courtesy of Jean-Francois Helias, Fishing Adventures Thailand.



EXPLANATION

DISTRIBUTION OF *Channa micropeltes*

- Native range
- Possible native range
- Introduced range

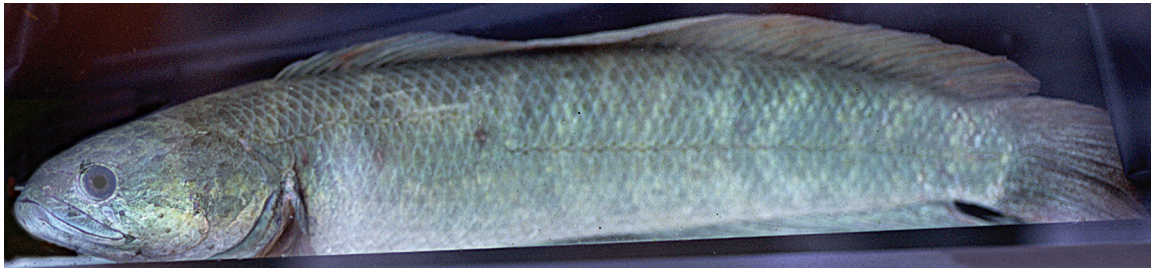
0 1,000 MILES

0 1,000 KILOMETERS

Scale is approximate

Channa micropeltes

***Channa nox* Zhang, Musikasinthorn, and Watanabe, 2002**
Night Snakehead



Purchased from a live-food fish market at Mong Kok, Hong Kong. Photograph by Heok Hui Tan.

Original description: *Channa nox* Zhang, Musikasinthorn, and Watanabe, 2002:140-146. *Channa nox*, a new channid fish lacking a pelvic fin from Guangxi, China. Ichthyological Research 49(2):140-146. Type locality: Nanliu River basin, vicinity of Hepu, Guangxi Province, China. Holotype: IOZCAS (Institute of Zoology, Chinese Academy of Sciences) 70028. Paratypes: IOZCAS 69848; IOZCAS 69849; IOZCAS 70029; IOZCAS 70039; and IOZCAS 70042.

Synonyms: No synonyms.

Common names: None in English. We propose **night snakehead** based on the dark coloration of the fish.

Native range: Southern China, near Hepu, Guangxi Province, specifically the lower Nanliu Jiang River, where its range overlaps that of its nearest congener, *Channa asiatica*. Peter Ng (personal commun., 2003) found this snakehead in live-food fish markets in Guangzhou, China, and Hong Kong in July 2000.

Introduced range: No introductions known.

Size: Reported to almost 20 cm (Zhang and others, 2002), but probably attains a larger size.

Habitat preference: Zhang and others (2002) reported the species from humid rainforest conditions. Appears to be a riverine species.

Temperature range: No information available. Nevertheless, distribution within native range (21-32° N) indicates a warm temperate to subtropical species.

Reproductive habits: No information available concerning reproduction in natural habitats, but likely a nest builder like most snakeheads. There are indications that the male of the most closely related species, *Channa asiatica* is perhaps a mouthbrooder. Whether such behavior applies to *C. nox* is unknown.

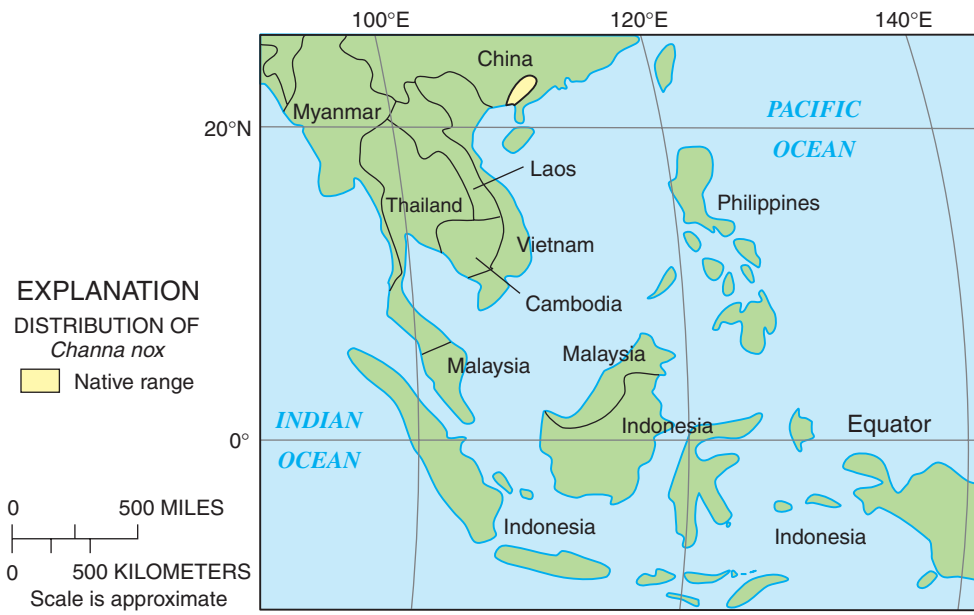
Feeding habits: No information available, but likely a thrust predator as is its closest relative, *Channa asiatica*.

Characters: Gular region of head with one to two scales on either side of underside of lower jaw. Pelvic fins absent. Head small, rounded. Dorsal fin rays 47-51; anal fin rays 31-33. Lateral line scales 55-63; 5.5-6.5 scales above lateral line; check scales 9-13. Total vertebrae 53-55. Large ocellus, black with white rim, on caudal peduncle. This species is most closely related to *Channa asiatica* which also lacks pelvic fins and has 49-53 vertebrae, 41-47 dorsal fin rays and 28-32 anal fin rays. *Channa nox* also differs in having a shorter predorsal length (26.9-28.4 percent) and snout length (3.6-5.1 percent). Live coloration also differs from *C. asiatica* in that *C. nox* is dark on the upper half of the body and the ocellus on the caudal peduncle lacks a white rim.

Commercial importance in the United States: None.

Commercial importance in native range: Available in local markets in Hepu, Guangxi Province, southern China (Zhang and others, 2002). Also reported as available in markets in Guangzhou and Hong Kong (Peter Ng, personal commun., 2003).

Environmental concerns: Likely a thrust predator on other fishes and invertebrates like other snakeheads.



Channa nox